

Minutes of the 17--18 September 2006 Magellan SAC Meeting (Pasadena)

Submitted by John Mulchaey

SAC Members Present:

Bob Kirshner (Chair)
Alan Dressler
Laird Close
John Mulchaey
Doug Richstone (for Mario Mateo)
Andy Szentgyorgyi (for Dan Fabricant)
Paul Schechter
Ian Thompson

Others present for all or part of the meeting:

Wendy Freedman
Jennifer Marshall
Frank Perez
Eric Persson
Mark Phillips
Miguel Roth
Steve Sheckman
Alan Uomoto
Alycia Weinberger

1. Preliminaries

- i. Mulchaey agrees to take notes.
- ii. Some minor corrections to the minutes from the previous meeting (April 2006). Weinberger commended on doing a great job with the minutes.
- iii. Updates on a few issues raised at previous meeting:
 - a. Dressler asks if a Users' Committee been set-up yet. No (Phillips)
 - b. Dressler asks if telescope time was taken off top for AO. Yes (Freedman)
 - c. Dressler asks if the ADC is working yet on Baade. Phillips notes that it has not been properly commissioned yet, so the answer is no. Might be ready by the end of the year.
 - d. Are the new slit mask submission rules working? Perez notes that

they are effective. There has been no process on setting up an auto-nag system.

- e. IMACS was not accepted by Council as a facility instrument.
- f. The low dispersion grism on LDSS-3 was tested in May, but is not generally available yet.

iv. Minutes are accepted (Kirshner moves, Thompson seconds) without opposition.

2. Director's Comments (Freedman)

The role of the SAC was raised at the previous meeting. Since that time, Mark Phillips has been appointed as the Associate Director of Magellan.

Freedman would like to see a more focused role for the SAC. The SAC's primary role is to provide scientific advise to the Council. Areas of advise include defining ports, determining FTEs needed, advise on future instrumentation, advise on mirror coatings, etc. The SAC should also facilitate scientific meetings - these should be on-going.

Two new committees have been established:

- i. The User's Committee role is to disseminate information to observers and provide advise to Phillips on the communities' needs.
- ii. The Operations Committee meets once a month to deal with technical issues. Mark is the Chair of this committee. Before the Council this time is an FTE for a telescope person recommended by the Committee. We have already hired 2 telescope operators and instrument specialists. Offers have also been made to replace Skip and to hire two Australian postdocs. We are reaching a point where operations are where they need to be.

3. Discussion on the role of the SAC

- i. Dressler sees the role of the SAC as primarily involved with the choosing, developing, commissioning and integration of instruments.
- ii. Schechter suggests a useful way to break things down is that the SAC is advisory to the Council, while the Users' and Operation Committees are advisory to the Director or Associate Director. An extreme version would be to have the SAC meet only when the Council needs advise. Dressler thinks this would place too much burden on the Council.

- iii. Phillips believes that it is not necessary for the SAC to meet every six months now that operations are routine. He would like to see the SAC serve as a coordinating body for instrument development. He also notes that the agreement says that the Council oversees day to day operations. Therefore, the Council's role is to oversee staffing issues. The SAC has not done a good job of understanding the resources on the mountain.
- iv. Thompson believes the SAC needs to meet more often than once a year given the timescale of instrument development (i.e. grant cycles, etc.). Dressler agrees and suggests that the SAC meet face to face once a year and via telecons at least every 6 months. Everyone seems to agree this is a good solution.
- v. Kirshner notes that there has not been much discussion previously of a scientific strategy for Magellan. The SAC is probably the right place for such a discussion. The SAC has not been good at getting information back to the community. The Users' Committee may help facilitate this.
- vi. Close says that one of the problems the Observatory faces is that instrument builders are getting money for new instruments before coming to the SAC. It is hard to stop projects once they have been funded. We should require that instruments be reviewed before they are allowed to apply for funding. Freedman notes that the Council must approve all instruments. The Council would like advise on potential instruments from the SAC.
- vii. Dressler asked whether the SAC should have a role in telescope scheduling. Thompson noted that there is a separate committee for scheduling. However, one of the future roles of the SAC could be decisions about the ability to schedule instruments when too many instruments exist to make them all available at once (i.e. block instrument scheduling). Phillips commented that the next SAC chair will really need to stay on top of things. We will soon reach a point where many instruments will be coming to the mountain at once. Perez is concerned that the SAC needs to have a better understanding of what resources are really available. Uomoto said it would be useful if all the information on future instruments was posted on-line somewhere.
- viii. Thompson raised the issue of how to deal with PI instruments. What do we do with PI instruments when all of the ports are taken? Perez noted that PI instruments can be a big burden for the mountain staff. For example, when POETS came to the Clay, LDSS-3 had to be taken off the port. It took considerable time and effort to get the dewer back in order. This demonstrates that it is hard to predict ahead of time how much effort is required to swap an instrument from a port. Uomoto commented that f5 and AO will have an even bigger impact on scheduling. Dressler suggested that the Users' and Scheduling committees should come to the SAC with proposed solutions for these issues.

- ix. Freedman commented that it would be good to get new blood on the SAC to keep more of the community involved. She is also hoping that some junior (i.e. non-tenured) people can serve as members of the Users' Committee. Schechter said this would not be a problem since the Users' Committee does not make decisions on funding or hires.

4. New SAC Chair

Several individuals were nominated to be the new SAC chair, but they all successfully declined. Thompson nominated Andy Szentgyorgyi, who noted that he would be happy to do it, but he is not formally a member of the SAC. Kirshner said the issue would need to be raised with the Harvard Director. There was great enthusiasm for Szentgyorgyi to be the new chair pending approval from Harvard. Kirshner agreed to serve as the SAC Chair for the remainder of the meeting.

5. Technical Manager's Report (Uomoto)

i. Instrument Development

- a. Uomoto has been meeting with instrument teams to catch potential interface problems (with the telescopes, guiders, computers, etc). This is important because it allows the Observatory to learn about the design, construction and maintenance of instruments early on.

ii. Instruments currently being designed

- a. PISCO (Parallel Imager for Southern Cosmology Observations). Currently being designed by Chris Stubbs, Tony Stark and Will Hugh.
- b. Planetary Finder Spectrograph. This PI instrument is halfway through construction. Being built by Paul Butler, Steve Sheckman and Jeff Crane.
- c. MagE. Early on in the construction phase. Being built by Scott Burles, Ian Thompson and Steve Sheckman.
- d. FIRE. Facility instrument being built by Rob Simcoe and Adam Burgasser.
- e. Four Star. Being built by Eric Persson. CDR happening later this week.
- f. Mosaic 2 (second CCD dewar for IMACS). The CCDs have been ordered and construction is expected to start soon.
- g. WFC (Wide Field Corrector for F5). Construction is almost finished.

iii. Recent Instrument Deployments

- a. MMTF. Successfully installed and tested. Further engineering this semester. Available in 2007A.
- b. POETS. PI instrument. Successful speckle tests. Successful photometric transit observations.
- c. F5 Secondary Mirror. The mirror is being integrated onto the polishing cell. Approximate finish date 2007.

iv. Guiders

- a. New lead screws are being used for finer position control. There have also been some other modifications to improve reliability.

v. Publications

- a. Observers are asked to send Magellan publications to Uomoto. At the moment we know of 186 refereed publications. Mulchaey asked how this compared to other telescopes. Close says that Gemini produces approximately 100 papers per year. Dressler noted that it would be good to normalize the publications by nights to make a fair comparison.

vi. Questions for Uomoto

- a. Kirshner wanted to know if Uomoto could give us an impression of where the major problems are with new instruments. Uomoto noted that most of the problems are related to interface issues with the telescope and guiders and that these issues can be avoided by having people in Chile involved early on.
- b. Weinberger asked whether the SAC needed to make a formal decision on PISCO. Uomoto noted that PISCO is a PI instrument and at the moment no procedure document exists for PI instruments.
- c. Kirshner asked if there are instruments coming to the mountain for which Uomoto has not yet interacted with the team. Uomoto said not to his knowledge. Perez asked about MIRAC 3. Uomoto noted that although MIRAC3 was not anticipated at Magellan, there have been discussion with U. of Arizona regarding MIRAC4. Phillips notes that the existing instrument document requires a written proposal with an estimate of the resources needed. He plans on getting such a document from each team. To his knowledge, everything that is coming to the mountain has been Somewhat approved by the SAC.

6. Telescope Report (Perez)

i. Accomplishments

- a. M2 mirror on Baade cleaned and aluminized. Throughput was 85% (at 4200A before, 89% after cleaning and 91.5% after aluminizing).
- b. Reorganization of the Clay control room.
- c. New instrument control computers racks in each equipment room.
- d. Successful POETS PI instrument run at Clay.
- e. Serial over IP work in progress.
- f. Updating of rotator drives from Glentek to PWM amplifiers is complete.
- g. Relocation of Magellan hardware to the Bodega is complete

ii. Problems

- a. Rotator bearing failure in Baade NIR west rotator. New bearing ordered with ETA of 9 months. An inspection of all the other rotator bearings found a problem with the Baade NIR east rotator. The balls of all of the bearings will be replaced to reduce the preload and friction.

Schechter asked whether the three problems he has now heard about the bearings was a coincidence. Perez says yes.

- b. Most common problem is with the primary mirror support. There has been significant improvement in this area with increased air pressure during periods of cold weather.
- c. There are also problems with the wind screen and moon roof drives. There has been no progress in fixing these.

iii. Work in Progress

- a. Working on new collimation procedures for F5.
- b. Serial over IP connection is about one-third done.
- c. New guider software- new IMS modules: same provider, new model
- d. Working on getting the network more reliable.

iv. Questions and discussion

- a. Close asked how long it takes to remove the f11 secondary. Perez says it

takes a morning to take it off. If we can get the same repeatability for f5, we can do the f11 to f5 swap in a day.

- b. Kirshner wanted to know what are the things that are not getting done that are the biggest concerns. Perez says we are still lagging on preventative maintenance. Phillips notes that the Operations Committee will be looking in to the tasks that are not being done.
- c. Richstone asked if there is any follow up on the adhesive used to bond the actuators. Phillips says that he will write-up the discussion had on this topic. The conclusion was that we would probably know when this is failing. Schechter asked if leaving the telescope out of a horizontal position for a long time would extend the lifetime. Several people said they thought this was possible.

7. Associate Director's Report (Phillips)

i. New hires

- a. An offer has been made for a telescope systems programmer (Skip Schaller's replacement).
- b. Two offers have been made for Magellan Fellows (Australian positions). This will start in 2007A. Dave Osip will supervise them.

ii. Commissioning of Instruments

- a. IMACS. The Council identified a few issues in the support agreement. A description of the instrument was requested defining which components and capabilities of IMACS are to be included. In addition, the Council requested more details about which routine support tasks are to be carried out by the Instrument Specialists and the Instrument Scientists.
- b. Mike. A draft support agreement is ready to be reviewed by the SAC.
- c. MagIC. Progress is being made on the outstanding work to be completed.
- d. LDSS-3. Mostly documentation remaining to be completed.

iii. Users' Committee

- a. Will be advisory to Phillips. Suggest that the Committee meet during scientific meetings when possible. The Committee meetings should be open to the public.

8. MIKE as a Facility Instrument

- i. Shectman provided a summary of Mike's capabilities. The instrument has a total throughput of about 20% on the red side and 37% on the blue side. The redside throughput will increase with a new red chip (purchased as part of the CCD order for IMACS).
- ii. The support agreement for MIKE was sent to the mountain staff for comments. The SAC received a copy last month. Based on suggestions from the mountain and SAC, the MIKE team will produce three additional things:
 - a. A log of electronic cards
 - b. Magellan engineering pages
 - c. Image archive to assist new users.
- iii. Thompson also noted that the physical limit to exposure times needs to be added as a comment to the documentation.
- iv. Thompson motioned for MIKE to be recommended as a facility instrument. Dressler seconded. The motion passed with 6 yes votes and one abstained (Richstone).

9. Update on F5 and MMIRS (Szentgyorgyi)

- i. Update and current schedule
 - a. The hardware for the f5 is mostly done. Software is taking longer, but some progress is being made. Expect the software to be done by March 2007. Could be brought to the mountain as early as May 2007 and tested using mini-cam.
 - b. MMIRS schedule is being driven by funding. The previous TCIP proposal did not get funding. Will propose again. If things go well, first light as early as December 2008 (somewhere). Some of the Harvard folks think LCO would be a good place for first light.
- ii. Questions and discussion
 - a. Richstone asked whether A.S. was really saying it would be easier to debug the f5 at LCO. Shectman pointed out that we will probably need to put the f5 on the telescope to really debug it. This requires taking the f11 secondary off. Uomoto noted that the mirror will not be ready until the middle of 2007 at the earliest. There will need to be at least two pre-science engineering runs. The first one will be needed to make sure the rotator is working at the Cassegrain focus and to put in the bafflings. This can occur before the mirror arrives at LCO. The second run could occur in the second half of 2007 once the mirror arrives.

- b. Several SAC members were concerned because the engineering time requirements seem to be larger than previously described. Uomoto noted that we will lose one night when we switch from f11 to f5 and one night when we switch back. How much of an impact this will have on the mountain staff is still not clear. Phillips noted that it would be important to get a commission plan in place soon. Kirshner requested that the f5 team put together such a plan for the next SAC meeting.

10. AO at Arizona (Close)

- i. Not much has changed from the previous SAC meeting. The plan is to save R&D resources by using an LBT clone AO system at Magellan. This will cost less than 25% of the original cost. NSF was presented with a modified plan and they have gone ahead and awarded the third year of funding they had been holding.
- ii. Current plan is for full optical tests in Arcetri test tower in Florence in spring 2007. Close loop tests in mid to late 2008. Could be mounted on either Baade or Clay, but Sheckman notes that Clay is the appropriate choice because the tertiary can be easily brought down.
- iii. The hope is to have a system that works from 0.5 to 20 microns. GLAO imaging should also be possible. For the engineering runs, the plan is to use a visible camera first and MIRAC 4 on subsequent runs. As the TCIP proposal was denied, about 1 million dollars is still needed for the wave front sensor. Otherwise, things are going well. A proper CDR is still needed. Current hope is to ship to Magellan sometime in 2009.
- iv. Phillips was under the impression that the system would be tested on the LBT first. Close notes that there is a chance this could happen, but more likely will do the testing with the LBT shell.
- v. Richstone is concerned about the manpower needs of the AO system and wanted to know what resources will be brought to the mountain. Close says two instrument specialists will be required for set-up and an additional person at night to run the system. His current idea is to hire an AO specialist. This person would be a PhD scientist. In addition, the LBT team can provide support for major problems.

11. IMACS and Mosaic 2 Update (Dressler)

- i. Mosaic 2 mostly a copy of the current IMACS camera. The primary change is with the focus mechanism. The redesign will make it possible to rotate the camera without having to remove it from the telescope. The CCDs have been ordered

- and the hope is to have the new camera on the mountain by late 2007.
- ii. Phillips asked if there are plans to retro fit the focus mechanism of the first camera. Answer: no such plans at the moment.
 - iii. The MMTF had an engineering run in May. The run went very well. One or two more engineering runs will take place in the current semester.
 - iv. Phillips notes that although the engineering run went very well, it is clear that fabry-perots are very difficult to operate and that it would be good if someone from the instrument team was on the mountain every time the instrument is used.
 - v. The f2 camera was tilted during the May engineering run to correct for aberrations. This did improve the situation, but still come focus issues exist when the weather is cold. Still hoping to understand the origin of this problem.
 - vi. Throughput tests for IMACS were performed in June using a laser. A throughput of 80% was measured for the collimator. The expected value is about 90%. Further tests on the individual elements will be done in the future. The current belief is that the throughput losses are due equally to the CCD and the optical elements. The new camera should get the throughput up to about 25% (currently more like 20%).
 - vii. There are also some issues with guiding. Rotation guiding slides off during some exposures. SH guiding tests by Pat McCarthy suggest there are some patches on the sky where the model seems to be off. Tests are also being done with the slit mask machine to look for errors in the cutting of masks.
 - viii. GISMO's design is complete and fabrication is ready to begin. Expect all parts in hand and assembled by late 2006 or early 2007 at the latest. Should be tested on the telescope in 2007A.
 - ix. A set of Sloan filters have been ordered. Some have arrived, some have not.

12. Update on Magic (Schechter)

- i. Magic worked on during recent engineering run. Scripts can now be aborted (but not when the telescope or filter wheel is moved). Magic operates in 1, 2 or 4 amp mode with 1x1, 2x2 and 4x4 binning possible. The manual has been updated to reflect the recent changes. One new problem emerged after the engineering run. The fits suffix is currently omitted on multiple reads. It is believed that this can be fixed with little effort.
- ii. Jim Elliot is planning on upgrading Magic to allow high speed photometry. This is in line with the original design of the instrument. The plan is to install

E2VCCD447-20 chips instead of ????. The hope is to do this in early 2007. Elliot will use Magic instead of POETS for his science.

- iii. Kirshner asked who decides if a facility instrument can be disrupted for an upgrade. Schechter notes that the proposed upgrade to Magic actually brings the instrument up to the originally proposed spec. Close would like to see a comparison of the abilities of the upgraded Magic with POETS. Thompson and Phillips think the Magic option is preferred and that it will allow most of the main science possible with POETS.
- iv. Philips wants to know the timescale for the cable wrap. Schechter says it would make the most sense to do this at the same time as MagE in the first half of 2007.

13. Update on FIRE (Schechter)

- i. FIRE is funded from an NSF MRI grant. The optical layout is nearly final and the mechanical design is now underway. A PDR will take place in fall 2006. The current projected delivery of the instrument to the mountain is 2008B.

14. Initial discussion on the number of ports

- i. The Council has decided that a total of six ports will be supported given current staffing on the mountain.
- ii. Thompson noted that only IMACS and MIKE have so far documented the amount of effort required to support and maintain the instruments. He does not understand why potentially ten instruments cannot be mounted, but only 6 supported during a semester. Philips commented that this was indeed consistent with the message sent to the Council by the mountain staff. Perez noted that at the moment the seventh port exists, but has not been commissioned. We currently don't have the manpower to commission this port.
- iii. Schechter also noted that one port must always be available for commissioning new instruments and PI instruments. For this reason, it is not possible to have instruments permanently mounted on every port. Richstone believes it is imperative that the limits on the ports be communicated with instrument builders - not every instrument currently planned can be a facility instrument. AS also noted that the load on the mountain staff is not really zero for idle instruments. There is always the need to upgrade software, etc.

15. Scheduling (Thompson)

- i. Thompson proposed that to facilitate scheduling, the TCIP and Australian nights be allocated to (and subsequently taken from) the Carnegie blocks. There was general agreement that this was a good idea.

End of Day 1

16. Clean Room Update (Perez)

- i. The Council approved funds to build a Magellan clean room.
- ii. After review, the mountain staff has decided to remove the storage from the auxiliary building and relocate the contents to the bodega. The offices in the auxiliary building will also be removed to allow this space to be used for storage. The lounge at the Clay will be converted to one office and one instrument lab (place to work on CCDs, etc) to replace the lost office space in the auxiliary building.
- iii. The current plan is to make a more universal room and get a portable clean room for part of it. The approximate cost will be \$200,000 for the building and \$50,000 for the clean room equipment.
- iv. Richstone asked if there was a written proposal regarding the clean room to the Council. Uomoto noted that there was, but that the details were not given at the time.
- v. Kirshner wanted to know if the clean room could be built in the auxiliary room instead. Perez said all of the auxiliary room is needed for storage.
- vi. Schechter said it was previously claimed that the clean room would only be used once or twice, so it was not clear a new building was required. Close says he thinks it would likely be used by many people. Thompson commented that it would be very useful if the space had all of the amenities typically used for lab space. Perez said the plan was to have all of things you would want in a lab space (power supplies, vacuum pumps, etc).
- vii. Richstone asked what was meant by "portable"? Is the plan to leave it up? Uomoto answered that it will be kept in the room permanently.
- viii. In the end, everyone was fine with the proposed plan presented by Perez.

17. Magellan Instrument Summary (Uomoto)

- i. Uomoto handed out a list of current or planned instruments for Magellan. The list includes secondaries.
- ii. Given the list of instruments and the restrictions on ports, there was a healthy discussion on what has to happen to allow the next few instruments on the telescope. It was decided to concentrate on our immediate needs which will be the instrument/port configuration when the next two instruments (PFS and MagE) arrive (likely in 2007).

- iii. Shectman notes that efforts are underway to make MIKE easier to take on and off the telescope and allow easy swaps with PFS. Philips asked how often PFS would be used. Shectman said probably twice a semester, but Thompson thinks there are at least five other groups in the consortium that will want to use it. Weinberger said that she believes PFS will be used by many observers requiring high spectral resolution. Philips says he expects a movement to eventually make PFS a facility instrument. Shectman notes that PFS should be simple to use and support and that MIKE should be even easier to support than it is now.
- iv. Kirshner asked if there are plans to commission the folded port soon. Uomoto says he has been thinking about this.
- v. There was considerable discussion about how to decide which instruments go on which telescope:
 - a. Schechter suggested that pairing an imager and spectrograph with a similar bandpass would make sense in many cases, i.e. MagE and Magic should be paired and Panic and Fire should be paired. Thompson noted that for some science programs (i.e. supernova follow-up), one could argue that it would be better to pair an optical instrument with a near-IR instrument. Richstone notes that new instruments are supposed to have a probationary period before they are accepted as facility instruments and that user demand during this period should dictate what instruments you want on the telescope.
 - b. Philips argued that science should dictate our decisions. He also noted that it will be important to consider de-commissioning instruments if there are several instruments with similar capabilities. For example, does it make sense to keep Magic when two other instruments are available to do imaging? One could also argue to retire LDSS-3 since similar capabilities exist with IMACS. Dressler commented that retiring LDSS-3 would have a big impact on scheduling given the already high demands for IMACS time.
 - c. Perez asked if there is a preference for folded ports 1, 2 or 3. Shectman noted that folded port 2 has the advantage of the parallactic angle being vertical.
 - d. Thompson suggested that one solution would be to have three instruments (MIKE, PFS and PISCO) share the east naysmith platform on Clay and have all of the other instruments fixed. Perez said that doing this would add a lot of effort to the mountain staff. Philips commented that having a standard computer interface would simplify things for the mountain staff. Richstone suggested that having a standard way to bolt things to the telescope would also be useful.
 - e. After much discussion, it was decided that moving Magic to Baade and putting PFS and MagE on Clay was the best solution for the immediate future. Under this scheme, Magic will be put on folded port 2 on Baade in 2007B. Thompson noted that this means there will be some downtime with Magic. The appropriate timing of the move will be worked out in

consultation with Jim Elliott.

18. Magellan Instrument Procedures and Policy (Phillips)

- i. The Magellan Facility Instrument Policy has been updated and renamed. The new document now includes PI instruments. It also emphasizes a change in the relationship between instrument builders and the observatory staff from "vendor-customer" to collaborators. The hope is to get instrument builders to follow all of the proposed steps in the policy.
- ii. Further discussion of the document will take place during the next telecom.
- iii. Richstone noted that the document does not current include a probationary period as was recommended by the recent Council sub-committee. In addition, there is not a procedure for an instrument to be rejected. For initial set of instruments, there was no real incentive for builders to consider ease of use and maintenance. However, with the limited number of ports available, this has changed.
- iv. Kirshner noted that instrument builders should be encouraged to talk with the mountain staff prior to applying for money. The SAC should also be consulted prior to applying for grants. Philips noted that the SAC will need to show some constraint with new instruments, something this body has not traditionally done.

19. Action items for telecon

- i. Approve new SAC Chair
- ii. Discuss the Magellan Instrument Procedures and Policy Document
- iii. Review Magic upgrade proposal
- iv. Further discussion on folded ports (is folded port 2 really preferred?)
- v. Identify volunteer to plan/host the next Magellan science meeting